iPhone Web Applications

From Start to Finish

Session 206

These are confidential sessions—please refrain from streaming, blogging, or taking pictures.

iPhone Web Applications

From Start to Finish

Greg Bolsinga
iPhone WebKit Engineer

iPhone Web Applications

Why?

- Leverage existing knowledge
- Leverage advanced iPhone and WebKit features
- Instant deployment

You'll Learn How To…

- Optimize your website for iPhone
- Create an iPhone web application
  - Full-screen mode
  - Offline data
  - Sophisticated graphics with CSS Visual Effects
  - Great performance
- Add advanced features
  - Orientation events
  - DOM touch events
  - Geolocation

Optimizing Your Website for iPhone

The basics

The Basics

Getting started with iPhone web technologies

- Custom interaction behavior
- Text sizing
- Screen size best practices
- Home screen icon

Demo

Paul Knight
iPhone WebKit Engineer

Custom Interaction Behavior

Changing Selection Behavior

- Prevent the Selection UI from displaying
  - This means no copying for these elements!
  - Use selectively
- CSS Property

```
<div style="-webkit-user-select: none;" />
```

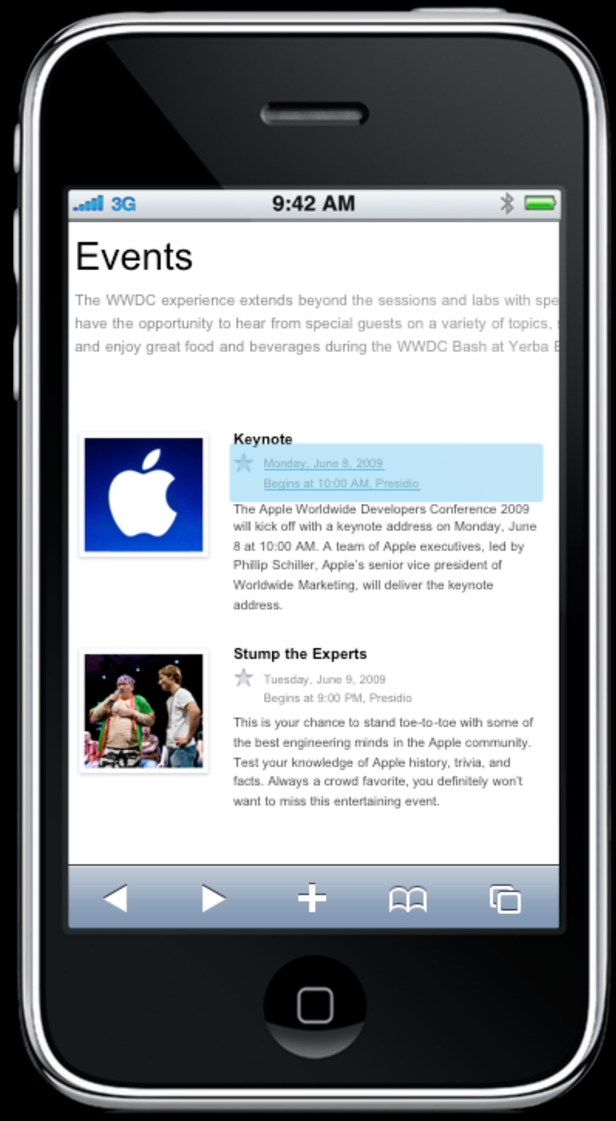
Changing Tap Highlight Behavior

- Gives user feedback about their interaction
- CSS Property
- Custom color
  - Make sure it has alpha!

```
<div style="-webkit-tap-highlight-color:
    rgba(99, 190, 236, 0.5);" />
```

- Hide completely with clear color

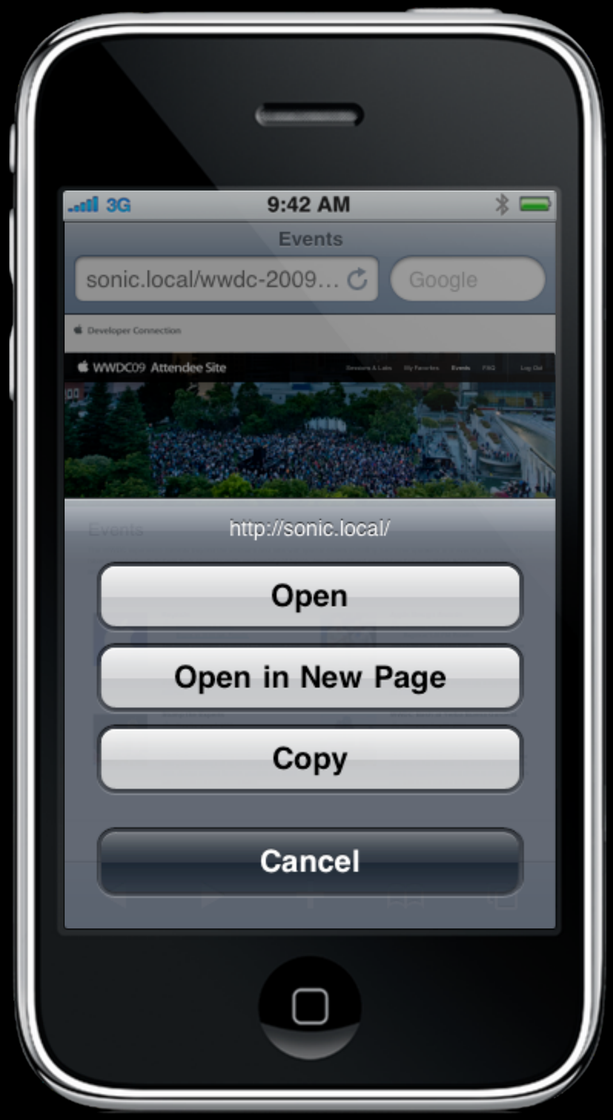
```
<div style="-webkit-tap-highlight-color:
    transparent;" />
```



Navigation and Sharing

- Links
  - Open in new page
  - Copying to pasteboard
- Images
  - Saving to photo library
  - Copying to pasteboard
- CSS Property

```
<div style="-webkit-touch-callout: none;" />
```



Text Sizing

3G
9:42 AM
Events
sonic.local/wwdc-2009…
Google
Developer Connection
WWDC09 Attendee Site
Sessions & Labs
My Favorites
Events
FAQ
Log Out
Events
The WWDC experience extends beyond the sessions and labs with special events including lunchtime speakers and evening activities. You'll have the opportunity to hear from special guests on a variety of topics, see development excellence honored at the Apple Designs Awards, and enjoy great food and beverages during the WWDC Bash at Yerba Buena Gardens.
Keynote
Apple Design Awards
Stump the Experts
WWDC Bash at Yerba Buena Gardens

Text Scaling

Automatically scaled

- Override default
  - None

```
<div style="-webkit-text-size-adjust: none" />
```

  - Auto (default)

```
<div style="-webkit-text-size-adjust: auto" />
```

  - By percentage

```
<div style="-webkit-text-size-adjust: 200%" />
```

Screen Size Best Practices

itial display

3G
9:42 AM
Events
sonic.local/wwdc-2009…
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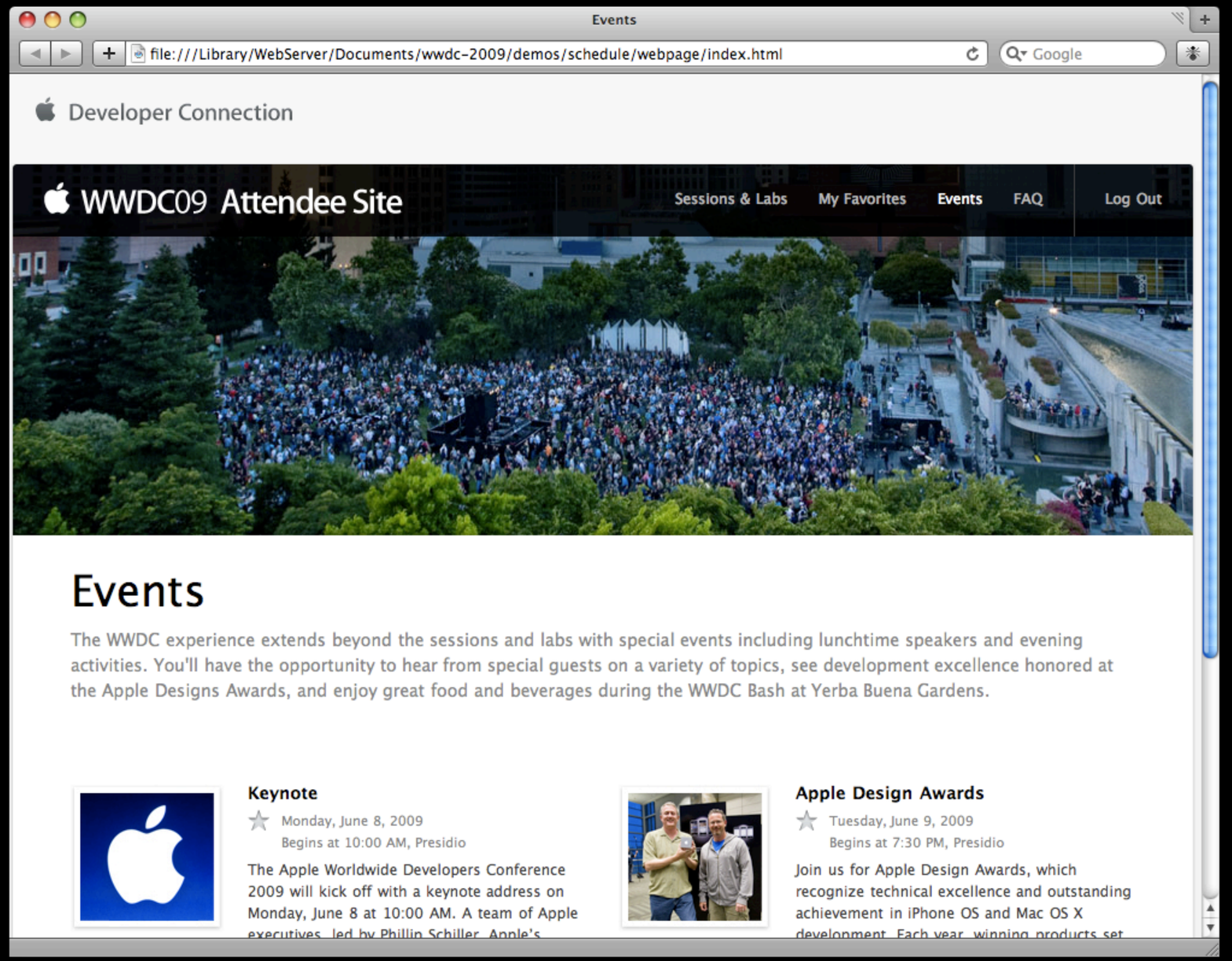
980 pixels


Events
file:///Library/WebServer/Documents/wwdc-2009/demos/schedule/webpage/index.html
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Monday, June 8, 2009
Begins at 10:00 AM, Presidio
The Apple Worldwide Developers Conference 2009 will kick off with a keynote address on Monday, June 8 at 10:00 AM. A team of Apple
Apple Design Awards
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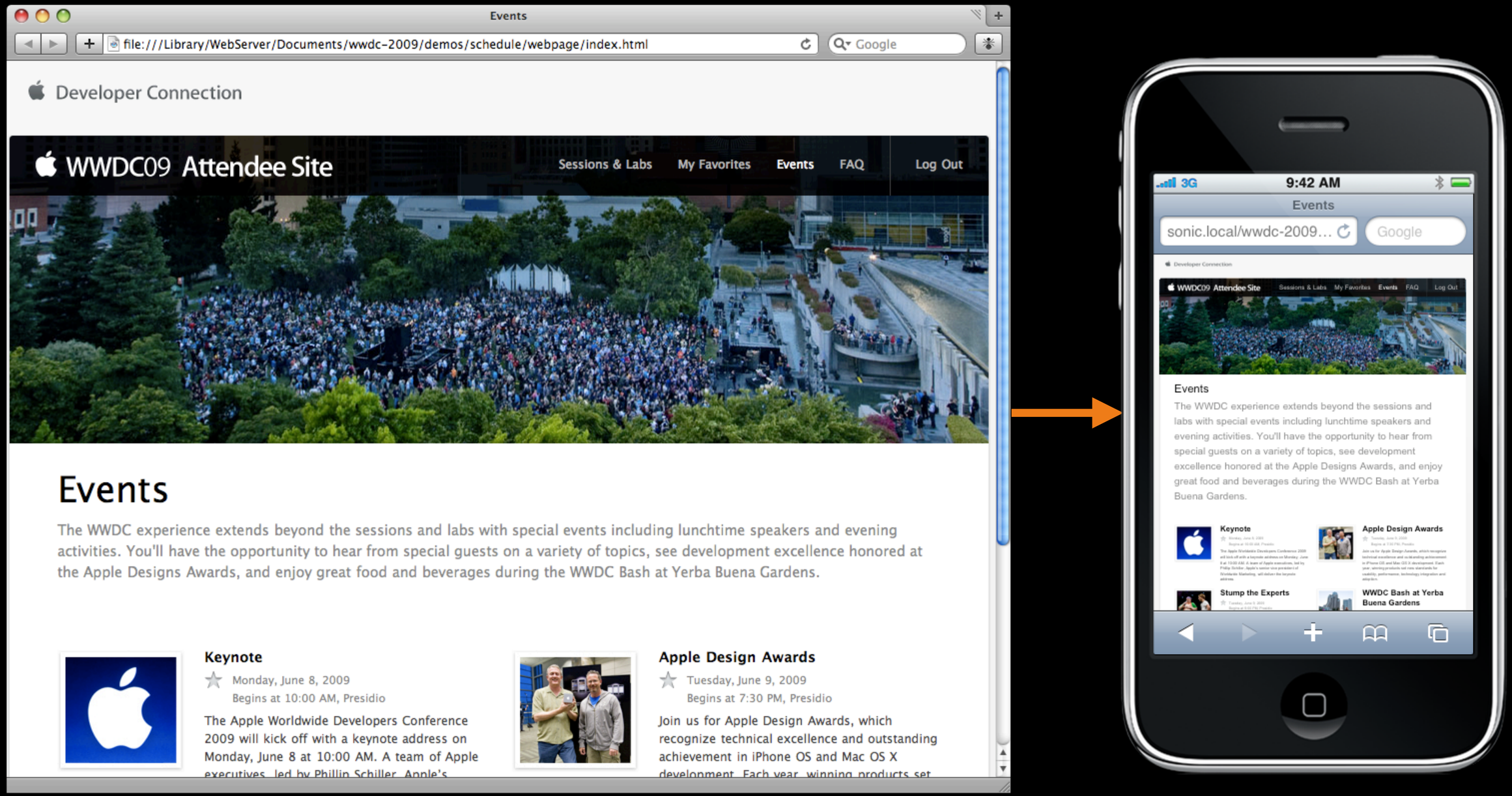
Join us for Apple Design Awards, which recognize technical excellence and outstanding achievement in iPhone OS and Mac OS X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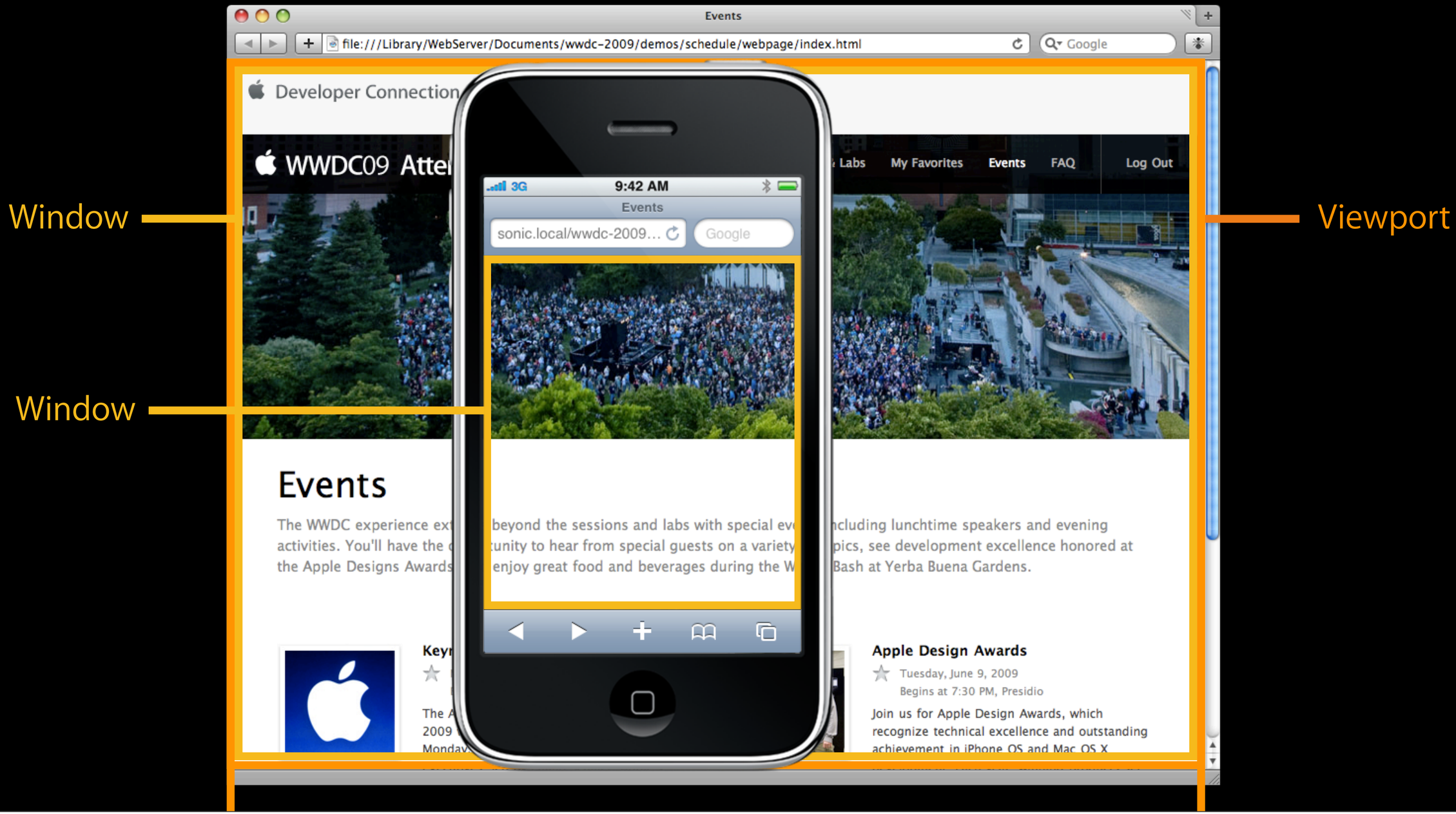
rt and Window

Window

Viewport

Viewport and Window



Customizing the Viewport

Make best use of screen real estate

- Use the width used by your website design

```
<meta name="viewport" content="width=1024" >
```

- For Web Apps use a constant
  - Keeps things looking great when rotating

```
<meta name="viewport" content="width=device-width" >
```

- Atypical usage
  - `height=device-height`

Home Screen Icon

3G
9:42 AM
Apple
Google
Contacts
Mail
Safari
iPod

Home Screen Icons

57 x 57 pixel PNGs

	Entire site (Install at root of web server)	Specified for a single page
Automatically rounded and “glassed”	apple-touch-icon.png	<link rel="apple-touch-icon" href="/touchicon.png" />
Automatically rounded	apple-touch-icon-precomposed.png	<link rel="apple-touch-icon-precomposed" href="/touchicon.png" />

Demo

Paul Knight
iPhone WebKit Engineer

The Basics

Getting started with iPhone web technologies

- Custom interaction behavior
- Text sizing
- Screen size best practices
- Home screen icon

Creating an iPhone Web Application

Building iPhone applications with web technologies

iPhone Applications, Web Technologies

Transitioning from websites to web apps

- Full screen
- Application screen scaling best practices
- High performance graphics
- Working offline

Demo

Paul Knight
iPhone WebKit Engineer

Going Full Screen

Going Full Screen

- More than a bookmark on the home screen
  - No address bar
  - No tab bar
- Always launches in portrait
- Links open in Safari on iPhone
  - Even if they are in the same domain!
  - Use XMLHttpRequest to load more data
- Custom status bar style
- Custom start up image

3.0

It’s a One Liner

Add to your web application HTML

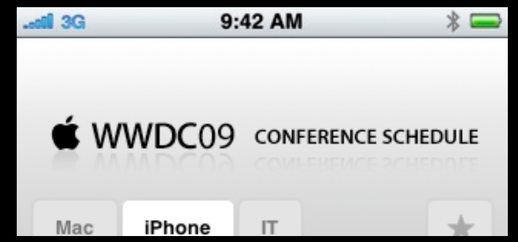
```
<meta name="apple-mobile-web-app-capable" content="yes">
```

- Can be queried

```
<script>window.navigator.standalone</script>
```

Custom Status Bar Style

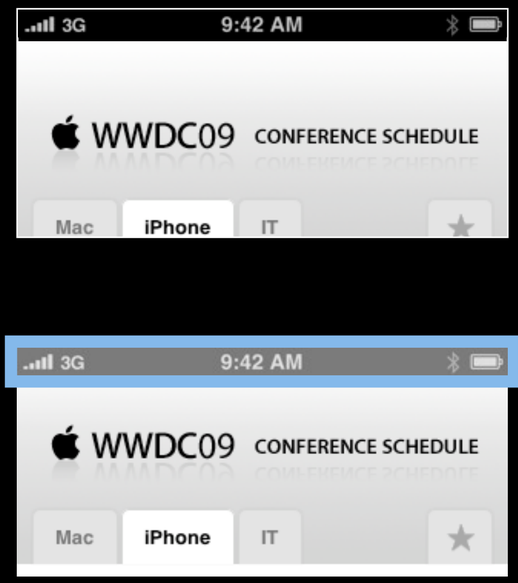
Default



- Same color as for Safari on iPhone

Solid black

```
<meta name="apple-mobile-web-app-status-bar-style" content="black">
```

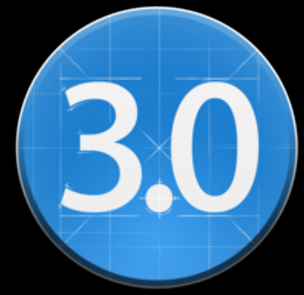


Black translucent

```
<meta name="apple-mobile-web-app-status-bar-style" content="black-translucent">
```


- Web content under status bar is not accessible!

Custom Start Up Image



- Image should be 320 x 460 pixels
  - Always portrait orientation
- Specified for a single page

```
<link rel="apple-touch-startup-image" href="/startup.png">
```

Screen Scaling Best Practices

Optimizing viewport scaling behavior

- initial-scale
- minimum-scale
- maximum-scale

```
<meta name="viewport" content="initial-scale=1.0, maximum-scale=2.0" >
```

- user-scalable

```
<meta name="viewport" content="initial-scale=1.0, user-scalable=no" >
```

Suggested Viewport Usage

- Use actual size with device-width
- No user scaling

```
<meta name="viewport" content="user-scalable=no, width=device-width">
```

High Performance Graphics

CSS Visual Effects

Animation!

```
.sessionList li.newFavorite {
    -webkit-animation-name: favorite;
    -webkit-animation-duration: 0.3s;
    -webkit-animation-iteration-count: 1;
}

@-webkit-keyframes favorite {
    from {
      -webkit-transform: scale(1);
    }
    20% {
      -webkit-transform: scale(0.90);
      animation-timing-function: ease-out;
    }
    50% {
      -webkit-transform: scale(1.2);
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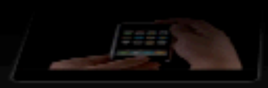
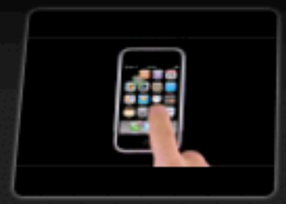
    }
}
```

Carrier 12:02 PM



Reset your iPhone

Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Consectetur adipisicing elit.

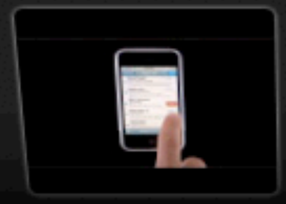


Customize Home Screen

Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit

Silence the ring

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt



Delete a message

Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua, ut enim ad minim veniam.

Create your favorites

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Related Sessions

Adding Innovative Styling and Animation to Webpages with CSS Effects	Mission Tuesday 3:30PM

Working Offline

iPhone may not always be online

Offline Storage

HTML 5 API

- http://dev.w3.org/html5/webstorage/

	Overview	Persistance	Advantages
Session Storage	Key/Value Pairs	Life of the Tab	Fast data access
Local Storage	Key/Value Pairs	Across reboots	Fast data access
Structured Data Storage	SQL Access	Across reboots	Fast data queries

Offline Application Cache

HTML 5 API

- http://www.w3.org/TR/offline-webapps/

Manifest file used to specify files to cache

```
<html manifest="/my-cache-manifest-file.manifest">
```

Determining if online

```
<script> var online = navigator.onLine; </script>
```

Related Sessions

Local Data Storage and Offline Web Applications for Safari	Russian Hill Thursday 3:30PM

iPhone Applications, Web Technologies

Transitioning from websites to web apps

- Full screen
- Application screen scaling best practices
- High performance graphics
- Working offline

Adding Advanced Features

Putting the “iPhone” in “iPhone Web Apps”

Adding Advanced Features

JavaScript APIs for iPhone

- Device orientation changes
- Multi-Touch support
- Location awareness

Demo

Paul Knight
iPhone WebKit Engineer

Device Orientation Changes

JavaScript Orientation Events

Orientation Changes

Attach to the <body>

```
<body onorientationchange="updateOrientation();">

<script>
  function updateOrientation() {
      switch (window.orientation) {
        case 0: break;   // Portrait
        case 90: break;  // Landscape -- Counter-Clockwise
        case -90: break; // Landscape -- Clockwise
      }
  }
</script>
```

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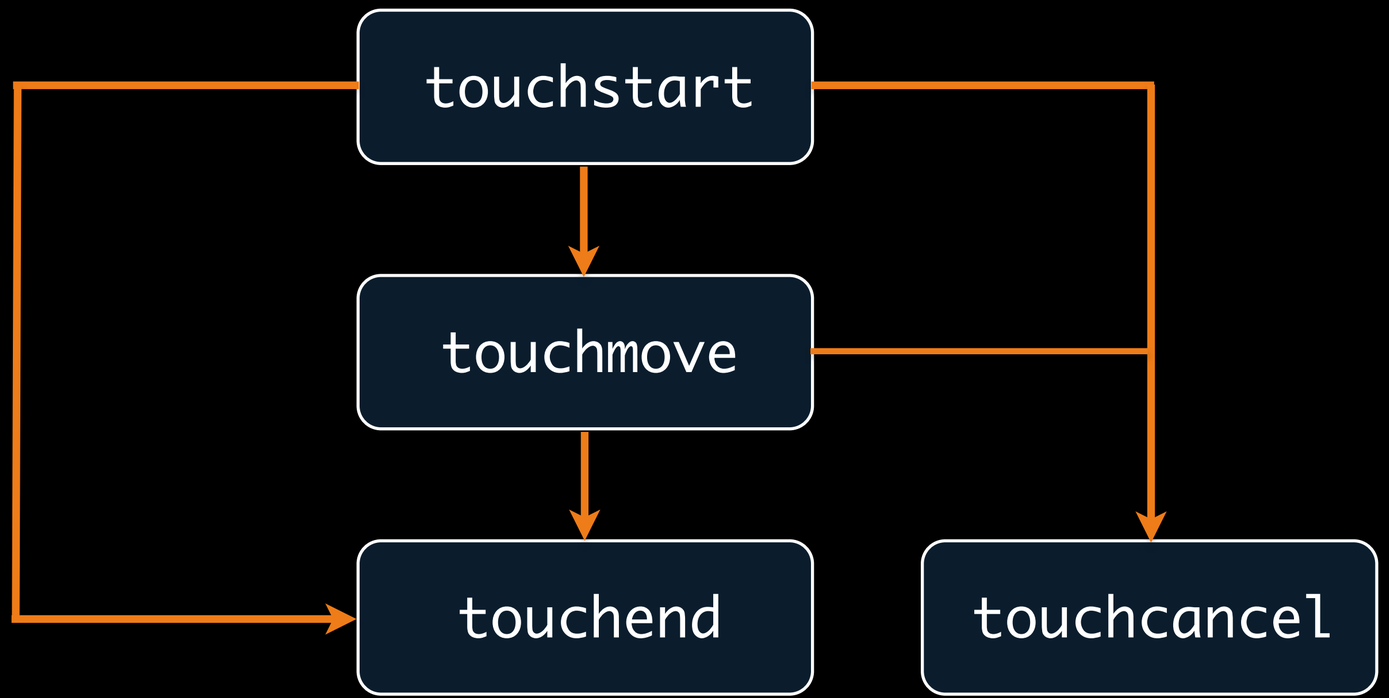
```

Multi-Touch Support

Direct interaction

Touch Events Details

For each finger




```
<div ontouchstart="touchesStarted()">
```

```
element.addEventListener("touchstart", touchesStarted, false);
```

Touch Event Handling

```
function touchesStarted(event) {
  // All current touches on the page
  var allTouches = event.touches;

  // All touches for the element receiving this TouchEvent
  var targetTouches = event.targetTouches;

  // All changed touches in this TouchEvent
  var changedTouches = event.changedTouches;

  // First Touch
  var touch = event.targetTouches[0];

  // The element touched by this Touch
  var target = touch.target;

  // Identifier for this touch
  var id = touch.identifier;

  // Touch location, relative to the viewport
  var x = touch.clientX;
  var y = touch.clientY;
}
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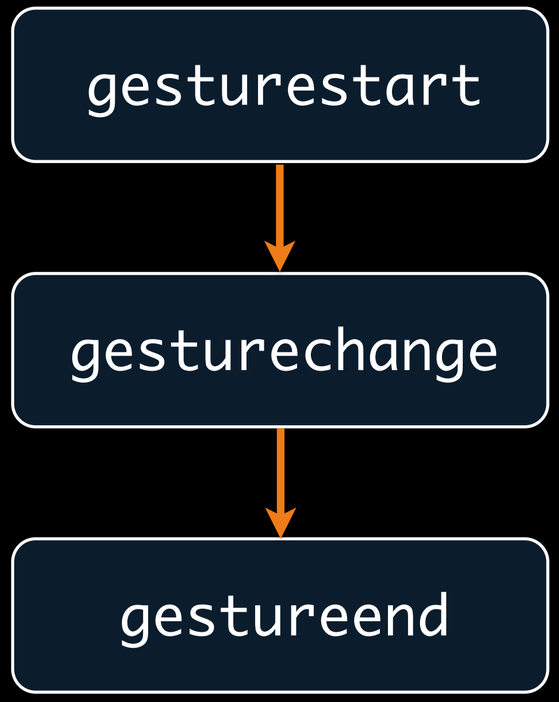
Gesture Event Details

For each gesture




```
<div ongesturechange="gestureChanged()">
```

```
element.addEventListener("gesturechange", gestureChanged, false);
```

Gesture Event Handling

```
function gestureChanged(event) {
  // The element targeted by this gesture
  var target = event.target;

  // Multiplier of distance change between fingers
  // Initially == 1.0
  // Pinch in < 1.0
  // Pinch open > 1.0
  var scale = event.scale;

  // Delta of rotation in degrees
  // Clockwise > 0.0
  // Counter clockwise < 0.0
  var rotation = event.rotation;
}
```

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  var rotation = event.rotation;
}
```

Multi-Touch and CSS Visual Effects

Work hand in hand

```
function touchMoved(event) {
    var touch = event.targetTouches[0];

    var tx = getTranslatedX(touch.clientX);
    var ty = getTranslatedY(touch.clientY);

    this.element.style.webkitTransform =
      "translate(" + t + "px, " + t + "px)";
}
```

Multi-Touch and CSS Visual Effects

Work hand in hand

```
function gestureChange(event) {
    var scale = getCurrentScale(event.scale);
    var rotation = getCurrentRotation(event.rotation);

    this.element.style.webkitTransform =
      "scale(" + scale + ") rotate(" + rotation + "deg)";
}
```

Location Awareness

3.0

- Geolocation JavaScript API
- W3C Editor's Draft
  - http://dev.w3.org/geo/api/spec-source.html
- Asynchronous
  - Location
  - Speed and heading

Accessing Geolocation

Attached to the navigator

```
if (navigator.geolocation) { /* code */ }
```

One shot position

```
navigator.geolocation.getCurrentPosition(positionCallback);
```

Observe position

```
var watchID = navigator.geolocation.watchPosition(positionCallback);
```

Stop observation

```
navigator.geolocation.clearWatch(watchID);
```

Getting a Position

```
function positionCallback(position) {
    position.timestamp; // DOM time stamp

    position.coords.latitude; // decimal degrees
    position.coords.longitude; // decimal degrees
    position.coords.accuracy; // meters

    position.coords.altitude; // meters
    position.coords.altitudeAccuracy; // meters

    position.coords.speed; // meters / second
    position.coords.heading; // Degrees from true North
}
```

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}
```

Accessing Geolocation

One shot position

```
navigator.geolocation.getCurrentPosition(positionCallback,
                                         errorCallback);
```

Observe position

```
var watchID = navigator.geolocation.watchPosition(positionCallback,
                                                  errorCallback);
```

Handling an Error

```
function errorCallback(error) {
    var err = error.code;

    switch (err) {
      case error.PERMISSION_DENIED: break;
      case error.POSITION_UNAVAILABLE: break;
      case error.TIMEOUT: break;
      case error.UNKNOWN_ERROR: break;
    }

    window.console.log(error.message);
}
```

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    }

    window.console.log(error.message);
}
```

Accessing Geolocation

One shot position

```
navigator.geolocation.getCurrentPosition(positionCallback,
                                         errorCallback);options);
```

Observe position

```
var watchID = navigator.geolocation.watchPosition(positionCallback,
                                         errorCallback);options);
```

Position Options

```
navigator.geolocation.watchPosition(positionCallback, errorCallback,
    {enableHighAccuracy:true,timeout:5000,maximumAge:60000});
```

```
bool enableHighAccuracy;
```

- Implies GPS
- Implies higher power usage

```
long timeout;
```

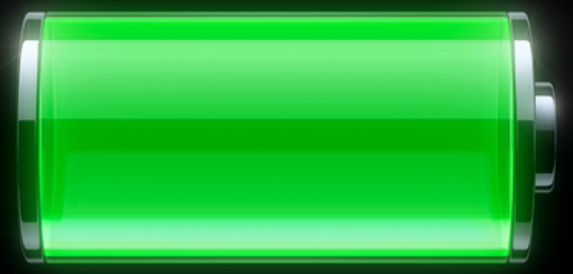
- Milliseconds
- Time willing to wait to get a position callback

```
long maximumAge;
```

- Milliseconds
- Used when old locations are satisfactory

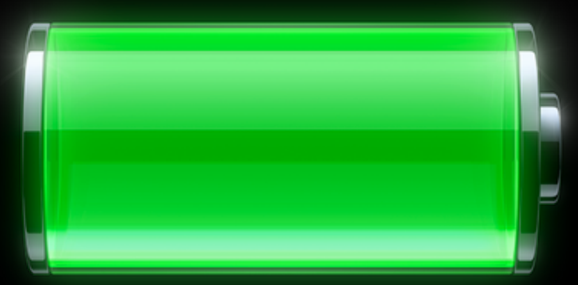
Geolocation Best Practices

- Mind battery life!
- When using `getCurrentPosition(…)`
  - A quick position is desired
  - Last known position is sufficient
    - Using `PositionOptions.maximumAge`



Geolocation Best Practices

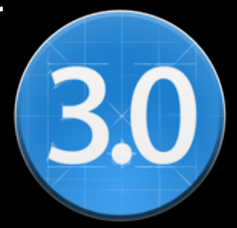
- Mind battery life!
- When using `watchPosition(…)`
  - Each position callback should be incrementally more accurate
  - Provide optimal user interface feedback
- Use standard JavaScript timers
- Explicitly stop watching position once…
  - Desired accuracy achieved
  - Timeout has been exceeded
  - An error occurs



Adding Advanced Features

JavaScript APIs for iPhone

- Device orientation changes
- Multi-Touch support
- Location awareness



You Learned How To…

- Optimize your website for iPhone
- Create an iPhone web application
  - Full-screen mode
  - Offline data
  - Sophisticated graphics with CSS Visual Effects
  - Great performance
- Add advanced features
  - Orientation events
  - DOM Touch events
  - Geolocation

Summary

- Building iPhone applications with web technology is simple
- Web technology provides access to many iPhone features
- Looking forward to many more great iPhone web applications!
  - http://www.apple.com/webapps/

More Information

Vicki Murley
Safari Technologies Evangelist
vicki@apple.com

Mark Malone
iPhone and Internet Evangelist
mmalone@apple.com

Documentation

Safari and WebKit
http://developer.apple.com/safari/

Related Sessions

Adding Innovative Styling and Animation to Webpages with CSS Effects	Mission Tuesday 3:30PM
Displaying Web Content in iPhone Applications	Marina Wednesday 9:00AM
Sophisticated Media Playback and Animation Through Open Web Standards	Mission Wednesday 3:30PM
Local Data Storage and Offline Web Applications for Safari	Russian Hill Thursday 3:30PM
Building Compatible Websites Using Emerging Web Technologies	Russian Hill Thursday 5:00PM

Labs

iPhone Web Applications Lab	iPhone Lab D Tuesday 5:00PM
CSS Effects Lab	OS X Lab A Tuesday 5:00PM
Safari Open Lab	OS X Lab B Wednesday 9:00AM
iPhone Web Applications Lab	iPhone Lab A Wednesday 5:00PM
Safari Open Lab	OS X Lab A Thursday 9:00AM
Media Playback in Web Applications Lab	OS X Lab C Thursday 10:30AM
Local Data Storage and Offline Web Applications Lab	OS X Lab A Thursday 5:00PM
WebKit Lab	OS X Lab D Friday 12:00PM

Q&A

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